Report on test in accordance with O.E.C.D. STANDARD CODE

O.E.C.D. No. 831

Agricultural Tractor
FENDT FARMER 309 LS TURBOMATIK

Manufacturer
X. Fendt & Co., Maschinen- und Schlepperfabrik
D-8952 Marktoberdorf

Deutsche Landwirtschafts-Gesellschaft e. V.
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This bulletin is based on engineering tests in accordance with the O.E.C.D. STANDARD CODE for the Official Testing of Agricultural Tractor Performance. It does not contain an evaluation of the tractor performance on practical work.

Duration of Tests: October 1981 till February 1982
DLG-Testing-Station for Agricultural Machinery, Max-Eyth-Weg 1,
D-6114 Groß Umstadt

This report has been approved by the O.E.C.D. Coordinating Centre (C.N.E.E.M.A., France) as being in accordance with the O.E.C.D STANDARD CODE.

Date of Approval: 23rd June 1982 O.E.C.D. No. 831

In this report all performance characteristics are given corresponding to the International System of Units.

The reference to the former used Technical System of Units is given by the following relations:

Forces	1 daN = 10 N = 1,02 kp	or 1 kp	= 0,981 daN
Powers	1 kW = 1,36 PS	or 1 PS	= 0,736 kW
Pressures	1 bar = 1,02 kp/cm²	or 1 kp/cm²	= 0,981 bar
	1000 mbar = 750,1 mm Hg		

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FENDT FARMER 309 LS

Test No. 80-258

Tractor manufacturer:	X. FENDT UND CO D-8952 Marktoberdorf
Submitted for test by:	Manufacturer
Selected by:	Manufacturer with agreement by DLG
Place of running-in:	Marktoberdorf and Groß-Umstadt
Duration of running-in:	Engine and tractor appr. 80 hours

SPECIFICATION OF TRACTOR

Tractor

Make:	X. FENDT UND CO
Model:	FARMER 309 LS TURBOMATIK
Type:	Wheel tractor, unit construction, all wheel drive
Serial-No.:	186/21/0057

Engine

Make:	MOTORENWERKE MANNHEIM AG
Model:	TD-226-4
Type:	Watercooled 4-stroke Diesel-engine, turbo supercharged, direct injection
Serial-No.:	TD 226.4.2.90102
Cylinders:	4, in line, bore 105 mm, stroke 120 mm, displacement 4156 cm^3, compression ratio 16; dry cylinder liners
Valves:	Overhead
Fuel system:	PIERBURG fuel feed pump PE 20136; BOSCH in line injection pump: PES 4A 80D 320/3 RS 1301, manufacturer's production setting 62 mm^3/stroke at rated speed and full load; injection timing 30° before TDC; BOSCH multihole injection nozzles DLLB 151 S 854, injection pressure 180 bar; BOSCH fuel filter with replaceable cartridge; capacity of fuel tank 108 l
Governor:	BOSCH centrifugal variable speed type governor EP/RSV 325-1500 A 2 B 505 DR; governed range of engine speed 650 to 2540 rev/min; rated engine speed 2350 rev/min

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Supercharger:	Exhaust driven supercharger, KÜHNLE, KOPP UND KAUSCH (KKK) K 26-259/8.11, max. supercharge pressure 0,8 bar
Air cleaner:	MANN dry paper element filter with pre-cleaner, with replaceable main catridge and safety cartridge, electrical maintenance indicator; air intake above bonnet; optionally available air intake with longer pipe and optional with cyclone
Exhaust silencer:	EBERSPÄCHER reflection-absorption-type silencer; 170 mm dia, 595 mm long; on the left hand side of engine, mouth showing rearwards to the left, 485 mm above ground; optional mouth showing upwards
Lubrication system:	Forced feed from gear type pump; strainer in sump; filter in full flow with by-pass valve and replaceable cartridge; oil and cartridge change period 200 operating hours; oil capacity 9,5 l; specified oil quality MIL-L-2104 C recommended oil viscosities: over + 5°C SAE 30 over -10°C to +10°C SAE 20W/20 below - 5°C SAE 10W Oil-cooling water heat exchanger within water cooler
Cooling system:	Watercooling with impeller pump; overpressure valve set to 0,4 bar; cooling circuit with by-pass and thermostat; fan with 7 blades, 455 mm dia; water capacity 13 l; optional cooling system for tropic conditions
Starting system:	Electrical BOSCH solenoid pre engaged-drive starting motor, 3 kW; BERU flame plug in intake manifold
Electrical equipment:	12 Volt, negative earth BOSCH 3-phase alternator KI 14 V 55A; 770W 1 lead acid battery, 110 Ah at 20 hours rating

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Transmisson

Clutch:	1. VOITH GETRIEBE KG fluid clutch 358 TD-F for travel and p.t.o. drive 2. FICHTEL UND SACHS AG dry disc type clutch GTNX 310, 310 mm dia, hydraulically operated by pedal, self readjusting
Gear box:	FENDT synchromesh speed change gear with 3 forward speeds and 1 reverse speed; 2 group gears: synchronized fine stepped group gear high/low (FS/FL); collar shifted road group (S), sliding gear shifted field group (A); 2 independent synchronized overdrive speeds, totally 14 forward and 4 reverse speeds; optionally available: 3rd overdrive speed (40 km/h) or creeper group
Rear axle:	FENDT portal construction; bevel gear drive; bevel gear differential with pedal operated lock, not selfdisengaging; differential lock with pilot lamp; double spur gear final drives in portals
Driven front axle:	ZAHNRADFABRIK FRIEDRICHSHAFEN AG APL 1552 driven by universal joint shaft on the left hand side of gear box, dry multi-disc clutch to be shifted by hand lever under load; bevel gear drive; bevel gear differential with automatic lock; planetary final drives
Oil change:	Fluid clutch all 5000 operating hours other gears all 1000 operating hours or once a year
Recommended oil qualities:	Gear box MIL-L-2105 final drives and front axle differential MIL-L-2105 B

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Oil capacity and viscosity:	Fluid clutch	5,8 l		SAE 10W
	gear box	32,5 l		SAE 80
	rear axle final drives	8,8 l	each	SAE 90
	front axle differential	6,0 l		SAE 90
	front axle final drives	1,0 l	each	SAE 90

Total ratios and speeds (tyres 18,4 R 34)

Group	Fine stepped group	Gear	Total ratio engine : driving wheel	Nominal travelling speed at rated engine speed *) km/h
Forward speeds				
A	FL	1	472,26	1,41
		2	295,16	2,25
		3	182,31	3,65
	FS	1	380,95	1,75
		2	238,10	2,79
		3	147,06	4,53
S	FL	1	118,06	5,63
		2	73,79	9,01
		3	45,58	14,59
	FS	1	95,24	6,98
		2	59,52	11,17
		3	36,76	18,09
1st overdrive			28,46	23,36
2nd overdrive			22,22	29,92
Reverse speeds				
A	FL	R	295,16	2,25
	FS	R	238,10	2,79
S	FL	R	73,79	9,01
	FS	R	59,52	11,17

*) Calculated with the radius index 770 mm, corresponding slip of fluid clutch see page 8

Power take-off

Main p.t.o.:

At rear of tractor;
driven by a dry multiplate clutch,
operated by hand lever on console;
height above ground 705 mm, in median plane of tractor,
356 mm behind rear axle centre line;
35 mm dia, 6 splines ISO 500/DIN 9611, type 1

2 speeds preselectable by hand lever:

1000 rev/min p.t.o. (with pilot lamp)

1032 rev/min at rated engine speed and full load
1060 rev/min at rated engine speed with no load,
standard p.t.o. speed 1000 rev/min at
2275 rev/min engine speed at full load or
2217 rev/min engine speed at no load

540 rev/min p.t.o.

581 rev/min at rated engine speed with no load,
standard p.t.o. speed 540 rev/min at
2185 rev/min engine speed with no load

fluid clutch slippage at full load
at rated engine speed 2,6%
at standard p.t.o. speed 1000 rev/min 2,6%

direction of rotation clockwise, viewed from tractor rear

optionally available p.t.o. with 750 rev/min instead of 1000 rev/min p.t.o.*)

Ground speed p.t.o.:

Optional,
not fitted on tested tractor

Secondary p.t.o.:

Optionally available front p.t.o. (1000 rev/min),
not fitted on tested tractor

*) from June 1982 tractor is equipped with
3 speed p.t.o. 540/750/1000 rev/min
2 speed p.t.o. is optional

Power lift

FENDT
hydraulic power lift, unit construction,
draft and position control, both infinitely mixable, floating position;
top link sensing, lowering throttle

Hydraulic system:

Open centre system;
BOSCH tandem gear type pump HY/ZFFS 11/16+14 directly driven by engine;
delivery 16 cm^3/rev or 40 l/min
at rated engine speed;
hydraulic filter with replaceable cartridge incorporated in return oil line, cartridge change every 1000 operating hours or once a year;
BOSCH control valve HY/SR 175/60L,
maximum working pressure 175 + 12 bar;
single acting cylinder with 86 mm bore and 138 mm stroke, with safety valve set to 210 bar;
2 external additional cylinders with 50 mm bore and 185 mm stroke

1 single acting auxiliary BOSCH control valve with return line fitted;
up to 5 single, partially double acting auxiliary valves with oil tappings and return lines in the rear and middle of tractor available;
flow dividing valve in steering oil circuit and additional control valve:
residual oil flow of steering circuit may be taken off directly and independently or in common with oil flow of hydraulic circuit through oil tapping;
separate hydraulic tank with 20 l capacity;
max. 8 l may be taken off through oil tappings when tractor is travelling,
16 l when tractor is working stationary

recommended oil:
engine oil SAE 20W/20 (tropics SAE 30)
MIL-L-2104C or MIL-L-46152

oil change after 1000 operating hours or once a year

Implement linkage at rear:	Three point linkage ISO 730/I or DIN 9674, category 2; length of lift rods adjustable by crank handles from 683 to 812 mm, with mean length of lift rods 748 mm lifting range above ground from 138 to 859 mm
Implement linkage at front:	Optionally available, not fitted on tested tractor
Holed drawbar:	Short bar, fitted on clevis of lower links, length between joint balls 810 mm, thickness 30 mm, width 100 mm, centre hole and 4 holes to each side, all holes 33 mm Ø; height above ground adjustable by power lift; with lift rods of 748 mm length the holed drawbar may be fixed hydraulically-mechanically to a height of 395 mm above ground measured at surface of bar; lower links stabilization by quick clamping devices; distance of holes' centre line with lower links in horizontal position: from rear axle centre 999 mm from p.t.o. shaft end 643 mm

Pull attachment

Trailer hitch:	ROCKINGER 273 U 140 non-automatical, optionally automatical hitch available; height above ground adjustable by one-hand quick adjustment to 500, 560, 750, 790, 830, 870 and 910 mm; hitch hole 33 mm dia, coupling pin dia 31 mm; distance of hitch hole centre to rear axle centre 526 mm, to p.t.o. shaft end 170 mm, permissible vertical load 1500 kg

Swinging drawbar: Reversible, height above ground 452 or 360 mm;
hitch hole 33 mm dia,
distance of hitch hole centre from rear axle 681 or 766 mm, from p.t.o. shaft end 325 or 410 mm, adjustable by shifting of the bar;
pivot point 200 mm behind rear axle centre;
drawbar lateral swingable about 150 resp. 190 mm to either side
additional fixed pin (piton fix) with 45 mm dia;
hitch optionally available

Towing hitch: 765 mm above ground at front of tractor

Steering

FENDT in cooperation with
ZAHNRADFABRIK FRIEDRICHSHAFEN AG
hydrostatic steering model 8491 with own oil circuit and oil filter in pressurized flow, filter change after 1000 operating hours or once a year;
oil supply by tandem part of hydraulic pump, displacement 14 cm^3/rev or
34 l/min at rated engine speed;
optional flow dividing valve in oil circuit of steering (see page 9, hydraulic system);
oil reservoir in common with power lift system;
1 double acting ram,
directly acting on front axle,
235 mm stroke, 50 mm dia,
piston rod 22 mm dia

Brakes

Parking brake: Internal-expanding-shoe brake;
mechanically acting on 2 brake drums on each differential half shaft,
180 mm dia, 30 mm width,
operated by pulling handle with ratchet

Service brake: FENDT in cooperation with
GIRLING BREMSEN GMBH
muscle power brake with hydraulic transmission to 2 disc brakes on the differential half shafts with 2 lining discs each, with 165 mm dia;
additional disc brake situated on joint shaft to front wheel drive;

Steering brake: Divided pedal of service brake,
for normal use locked together

Wheels

Steered wheels: 2 pneumatics in front 14,9 - 24 6 ply,
radial type casing;
max. permissible load per tyre 1510 kg
at 1,4 bar inflation pressure and 30 km/h;
track width 1696 mm;
track width adjustable to 1835 mm
by reversing wheels;
rims W 12 x 24;
optionally offset lug type rims available

Driven wheels: At front and at rear;
driving rear wheels:
2 pneumatics 18,4 R 34 8 ply,
radial type casing;
max. permissible load per tyre 2565 kg
at 1,4 bar inflation pressure and 30 km/h;
track width 1656 mm, adjustable to 1516 mm
by reversing wheels;
rims DW 14L x 34;
optionally offset lug type rims available

Wheel base: 2320 mm

Cab

Own make
OECD-tested safety-cab
OECD-No. CSD 0274/7;
optionally OECD-tested safety frame with roof available;
cab mounted to tractor by 4 silent blocks; *)
front-, rear- and side windows tiltable;
doors on both sides with additional stop devices for ventilation;
2 steps each on either side, 550 and 805 mm above ground;
combined heating and ventilation system with blower, connected to the cooling circuit;
air outlet jets near the cab floor and at the windscreen;
additional fan-assisted ventilation system in the roof optionally available

*) cab can be tilted rearwards for maintenance purposes

noise-reduction materials
floor:
2-layer-bitumen-mat 4 mm,
heavy-layer nap pattern mat with rubber foam lining 12 mm

mudguards:
PUR-foam coated with imitation leather 15 mm;
roof:
moulded resin-impregnated, cotton fibres 6 mm;
instrument and steering console:
sheet metal plates coated with bitumen-mat 4 mm,
rubber foam mat 40 mm below instrument panel,
additional rubber foam stripes 50 to 70 mm in lower part of console

Seat

GRAMMER DS 85H/50R
upholstered seat with arm rests and folding back rest (upper part),
adjustable spring with shock absorber;
additional horizontal spring suspension with shock absorber;
height of platform above ground 1070 mm,
height of unballasted seat above platform adjustable in 2 steps from 500 to 560 mm;
longitudinal adjustment range 180 mm;
optionally seat GRAMMER DS 85H/90 AR available

Number of grease points 18

Dimensions

Total length:	3910 mm	without ballast
	4935 mm	with ballast
Total width:	2105 mm	without ballast
	2105 mm	with ballast
Total height:	2630 mm	to top of cab roof, optionally cab with roof which is 70 mm lower available
Ground clearance:	385 mm	below swinging drawbar

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Lighting equipment: Electrical, 12 Volt
as per German legislation

	Dimensions mm	Height above ground to centre mm	Distance from outside edge of tractor to centre mm
Head lamps	135 x 115	1090	873
Side lamps	65 x 20	1485	230
Rear lamps	33 x 60	1525	350
Reflectors			
1st pair	115 x 25	1460	350
2nd pair	70 ø	625	663

Available wheel equipment

Wheel equipment			
front		rear	
12,4-24	6 ply	13,6-38	8 ply
12,4-28	6 ply	14,9-38	8 ply
13,6-24	8 ply	16,9-34	6 ply
14,9-24	6 ply	18,4-30	8 ply
14,9/80-24	10 ply	18,4-34	8 ply
11,2-28	6 ply	9,5-44	8/12 ply
9,5-28	6 ply	9,5-48	8 ply
9,5-32	10 ply		

Running-time meter: Mechanical, with tachometer combined, driven by camshaft of engine; reference engine speed for one really counted hour 1715 rev/min

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TEST CONDITIONS

Track of wheels	front	1696 mm
	rear	1656 mm

Weights — During drawbar performance tests

		Without driver	With driver
Without ballast:	front	1535 kg	1545 kg
	rear	2420 kg	2490 kg
	total	3955 kg	4035 kg
Ballast in front:	1 front frame		365 kg
	22 weights, total weight		725 kg
Ballast at rear:	1 rear frame		595 kg
	7 weights, total weight		249 kg
	water in the tyres		531 kg
With ballast:	front	2590 kg	2600 kg
	rear	3830 kg	3900 kg
	total	6420 kg	6500 kg

Fuels and lubricants used in test

Fuel: ARAL Diesel-fuel DIN 51 601

specific gravity at 15°C

at engine test	0,832 kg/l
at p.t.o. test	0,832 kg/l
at drawbar test	0,828 kg/l

Engine:	MOBIL DELVAC 1320	SAE 20W/20
Fluid clutch:	MOBIL DELVAC 1310	SAE 10W
Transmission:	MOBIL MOBILUBE GX 80 A	SAE 80
Differential in front, final drives at rear and in front:	MOBIL MOBILUBE HD 90	SAE 90
Power lift and power steering:	MOBIL DELVAC 1320	SAE 20W/20

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COMPULSORY TESTS

(1) MAIN POWER TAKE-OFF PERFORMANCE (1000 rev/min)

Date of tests: 16th November 1981
Location of tests: DLG-Testing-Station Groß-Umstadt
Type of dynamometer: SCHENCK hydraulic dynamometer U1-40

Power	Speed engine	Speed fl.clutch output	Speed p.t.o.	Fuel consumption hourly	Fuel consumption hourly	Fuel consumption spec.	Specific energy
kW	rev/min	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
Maximum power							
At 2-hour test							
58.7	2280	2222	1002	16.98	14.12	241	3.46
At rated engine speed							
58.6	2350	2289	1032	17.23	14.34	245	3.40
Part loads, the governor hand lever in the position corresponding to the maximum power at full load							
(i) 85% of the torque at maximum power at 2-hour test							
52.5	2390	2337	1054	15.81	13.16	251	3.32
(ii) unloaded							
-	2540	2540	1146	4.87	4.05	-	-
(iii) 50% of the torque defined in (i)							
27.3	2460	2430	1096	10.16	8.45	310	2.69
(iv) maximum power							
58.7	2280	2222	1002	16.98	14.12	241	3.46
(v) 25% of the torque defined in (i)							
13.9	2500	2485	1120	7.43	6.18	443	1.88
(vi) 75% of the torque defined in (i)							
40.2	2430	2388	1077	13.02	10.83	269	3.09

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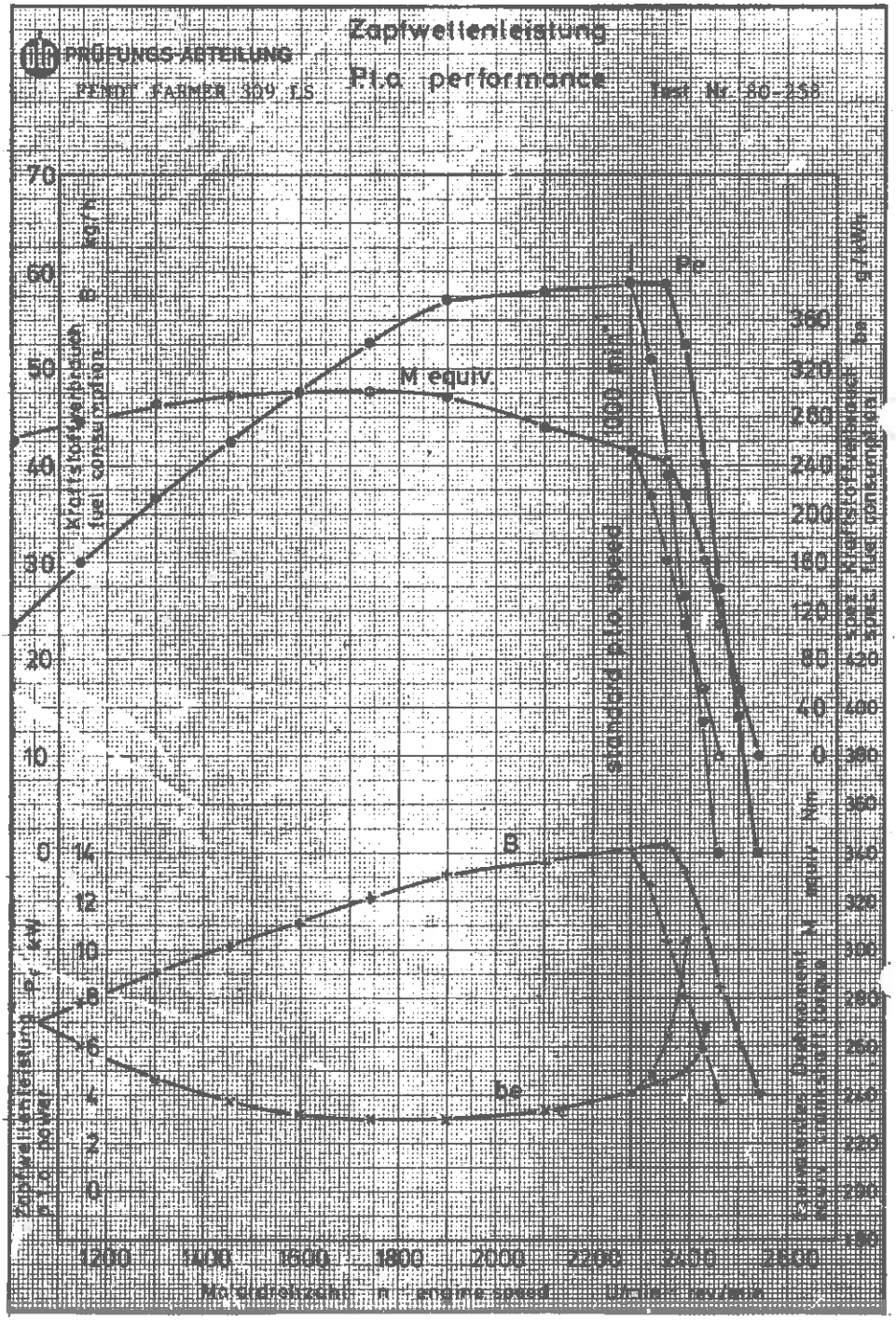
Power	Speed engine	Speed fl.clutch output	Speed p.t.o.	Fuel consumption hourly		Fuel consumption spec.	Specific energy
kW	rev/min	rev/min	rev/min	l/h	kg/h	g/kWh	kWh/l
Part loads, the governor hand lever in the position corresponding to the standard p.t.o. speed at full load							
(i) 85% of the torque at maximum power at standard p.t.o speed							
50.9	2318	2264	1021	15.20	12.64	248	3.35
(ii) unloaded							
-	2460	2460	1110	4.50	3.74	-	-
(iii) 50% of the torque defined in (i)							
26.5	2388	2354	1062	9.69	8.06	305	2.73
(iv) maximum power							
58.7	2275	2217	1000	17.01	14.15	241	3.45
(v) 25% of the torque defined in (i)							
13.5	2425	2407	1085	7.08	5.89	435	1.91
(vi) 75% of the torque defined in (i)							
39.0	2352	2312	1042	12.42	10.33	265	3.14

Standard specific fuel consumption (g/kWh): 251/310/248/305

No load maximum engine speed: 2540 rev/min
Equivalent flywheel torque at maximum power (2 hours): 252 Nm
Maximum equivalent flywheel torque: 301 Nm at 1740 rev/min of the engine

Mean atmospheric conditions:	temperature	20 °C
	pressure	1011 mbar
	relative humidity	33 %
Maximum temperatures:	coolant	88 °C
	engine oil	105 °C
	fuel	17 °C
	engine air intake	19 °C

The equivalent flywheel torques are given relative to the output shaft of the fluid clutch


PRÜFUNGS-ABTEILUNG
PÉNOT FARMER 309 FS
Zapfwellenleistung
P.t.o. performance
Test Nr. 80-155
Pe
M equiv.
B
be
Motordrehzahl n engine speed U/min rev/min
1200
1400
1600
1800
2000
2200
2400
2600

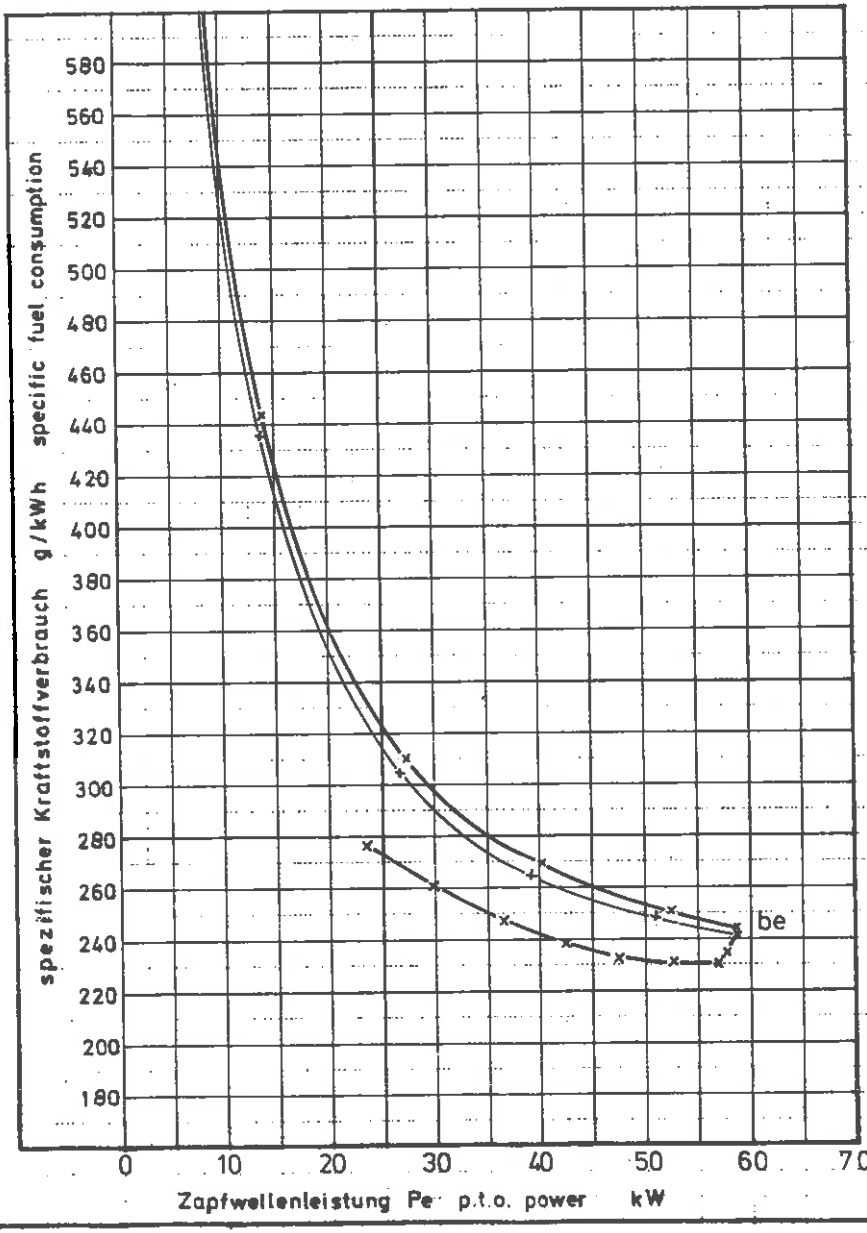
PRÜFUNGS-ABTEILUNG

FENDT FARMER 309 LS

Zapfwellenleistung

P.t.o. performance

Test Nr. 80-258



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(2) DRAWBAR PERFORMANCE

Date of tests: 18th January till 12th February 1982
Type of track: Concrete

Gear no. and group	Driving speed km/h	Power kW	Drawbar pull daN	Engine speed rev/min	Slip of wheels %
(i) MAXIMUM POWER (unballasted) height of drawbar above ground 460 mm					
2.A.FS	2,52	31,5	4500	2426	15,0
3.A.FL	3,22	40,1	4485	2395	15,0
3.A.FS	3,89	47,7	4413	2283	13,0
1.S.FL	5,13	50,6	3572	2280	7,5
1.S.FS	6,47	50,5	2812	2281	5,6
2.S.FL	8,51	51,1	2163	2285	4,0
2.S.FS	10,63	50,0	1693	2281	3,2
3.S.FL	13,99	49,3	1269	2281	2,3
(ii) MAXIMUM POWER (ballasted) height of drawbar above ground 420 mm					
1.A.FL	1,29	25,1	7010	2459	14,9
1.A.FS	1,57	30,5	6992	2439	15,0
2.A.FL	2,00	38,9	7010	2398	14,9
2.A.FS	2,37	46,0	6982	2294	14,9
3.A.FL	3,35	49,6	5334	2284	7,4
3.A.FS	4,21	50,0	4272	2277	5,5
1.S.FL	5,32	50,6	3427	2280	4,3
1.S.FS	6,65	49,9	2700	2279	3,2
2.S.FL	8,62	48,6	2031	2281	2,4
2.S.FS	10,74	47,1	1577	2280	1,8
(iii) FIVE-HOUR-TEST at 75% of pull at maximum power in 1.S.FL speed					
1.S.FL	5,70	40,7	2570	2403	3,1
(iv) FIVE HOUR TEST at pull corresponding to 15% wheel slip in test (ii)					
2.A.FS	2,33	45,2	6982	2304	-

Total oil consumption during ten hours duration of tests (iii) and (iv) 31 g/h

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Tyre size front: 14,9 - 24 6 ply
rear: 18,4 R 34 8 ply

Tread bar height at the beginning of drawbar tests
front 92%, rear 90% of the value when new

Specific fuel consumpt. g/kWh	Specific energy kWh/l	Temperatures Fuel °C	Coolant °C	Engine-oil °C	Atmospheric conditions Tempe-rature °C	Relative humidity %	Pressure mbar
tyre inflation pressure 0,9 bar front, 1,1 bar rear							
342	2,41	25	80	105	-3	90	1010
318	2,60	25	85	105	-3	86	1011
296	2,80	25	85	105	-3	80	1011
280	2,96	25	80	105	-3	85	1011
280	2,95	24	78	105	-5	91	1010
276	2,99	25	86	105	0	80	1010
284	2,91	25	86	105	0	86	1010
288	2,87	25	86	105	0	86	1010
tyre inflation pressure 1,1 bar front and rear							
381	2,17	18	78	100	6	88	1007
356	2,17	18	78	100	6	88	1007
327	2,53	25	81	105	8	82	1008
307	2,69	24	74	110	8	85	1008
286	2,90	23	75	110	8	88	1008
285	2,90	23	76	108	8	94	1008
280	2,96	23	76	105	8	91	1008
285	2,91	23	76	106	8	91	1008
288	2,87	24	75	105	10	86	1008
300	2,76	24	75	105	10	86	1008
309	2,68	18	83	108	4	88	1008
-	-	17	84	80	5	85	1000

Test (iv) was carried out with additional ballast,
the figures not quoted are therefore irrelevant

(3) TURNING SPACE AND TURNING CIRCLE

Wheel equipment front: 14,9 R 24 6 ply
rear: 18,4 R 34 8 ply

Track of wheels front: 1696 mm
rear: 1656 mm

	With brakes left-hand m	With brakes right-hand m	Without brakes left-hand m	Without brakes right-hand m
Radius of turning space	4,43	4,48	5,18	5,21
Radius of turning circle	4,05	4,10	4,80	4,83

(4) LOCATION OF CENTRE OF GRAVITY

Height above ground	938 mm
Distance forward from rear axle centre	885 mm
Distance from tractor's median plane, to the left	7 mm

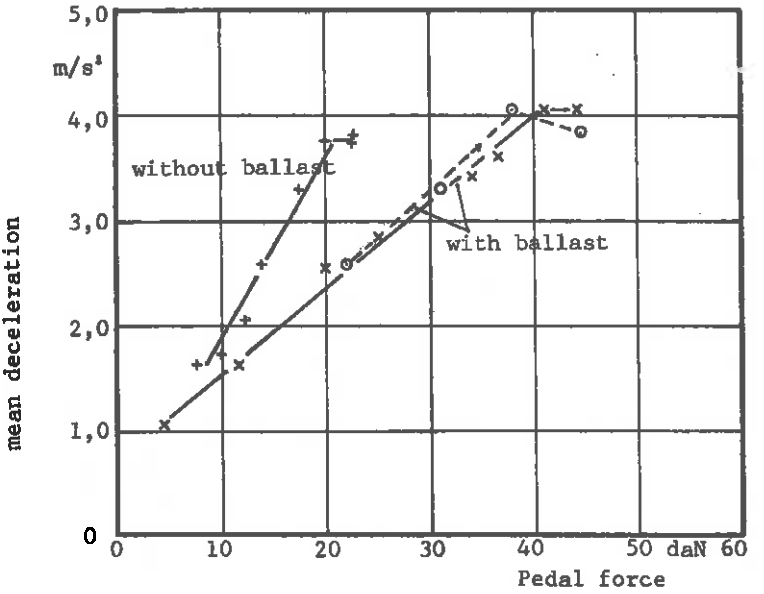
(5) Braking

Date of tests: 4th and 10th February 1982

Tractor masses during tests with driver:	front kg	rear kg	total kg
without ballast	1545	2490	4035
with ballast	2600	3900	6500

A) Service brake

Type-0-test (cold brakes) ——— , Type-I-(fade)test – – –



Speed before application of brakes, without ballast 31,97 km/h
with ballast 31,26 km/h

The brakes were heated by towing of the tractor for 1 km

B) Parking brake

	Ballasted tractor on 18%-slope		Unballasted tractor on 12%-slope with trailer of 3000 kg	
	up	down	up	down
Braking device control force daN	16	18	12	14

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(6) MEASUREMENT OF EXTERNAL NOISE LEVEL

Date of test: 4th February 1982
Type of track: Concrete
Type of sound level meter: BRÜEL AND KJAER model 2203

Results of test

Gear: 2nd Overdrive
Travelling speed before acceleration: 23,8 km/h
Sound level: 88,5 dB(A)

(7) NOISE MEASUREMENT AT THE DRIVER'S EAR

Date of tests: 18th January 1982
Type of track: Concrete
Type of sound level meter: BRÜEL AND KJAER model 2203

The tractor was fitted with FENDT safety cab

Results of tests

Gear	Drawbar pull at which the tractor develops the maximum sound level daN	Travelling speed nominal km/h	Travelling speed effective km/h	Sound level dB(A)
1.A.FL	4350	1,41	1,33	82,5
1.A.FS	4368	1,75	1,63	83,0
2.A.FL	4336	2,25	2,06	83,5
2.A.FS	4365	2,79	2,80	84,0
3.A.FL	4357	3,65	3,31	84,0
3.A.FS	4229	4,52	4,11	84,0
1.S.FL	3458	5,63	5,30	84,0
1.S.FS*)	2706	6,98	6,68	83,5
1.S.FS*)	light load	6,98	7,77	81,0
2.S.FL	2034	9,01	8,75	84,0
2.S.FS	1604	11,17	11,01	84,0
3.S.FL	1186	14,59	14,45	84,5
2nd Overdrive	light load	29,92	31,76	84,0

*) The 1st S FS-gear corresponds to the travelling speed nearest to 7,5 km/h

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(8) POWER LIFT AND HYDRAULIC PUMP PERFORMANCE

Date of tests: 7th December 1981

Power Lift

	Height of lower hitch point above ground in down pos. mm	Vertical movement mm	Max. force exerted through full range daN	Corresp. pressure of hydraul. fluid bar	Moment about rear axle daNm	Max. tilt angle of mast over range of lift degrees
At hitch points	138	721	2730	158	-	-
On the frame	138	804	2370	158	3813	10 *)

Temperature of hydraulic fluid at start of test 65 °C

*) max. tilting angle of mast from vertical position to max. height 5°

Lifting heights relative to horizontal lower links

mm	-478	-421	-400	-300	-200	-100	0	+100	+200	+300	+326	
Lifting forces at hitch points												
daN		2730	2770	2870	2960	3020	3000	3000	2980	3020		
Lifting forces at test frame												
daN	2540		2590	2610	2630	2650	2630	2540	2460	2370	2370	

Hydraulic Pump Performance

Opening pressure of the relief valve in remote circuit	165	bar
Sustained pressure with relief valve open	183	bar
Pump delivery rate at minimum pressure, the governor control lever being set for max. power	42,5	l/min
Hydraulic power at 90% of relief valve setting	10,3	kW
Corresponding delivery rate	37,6	l/min
Pressure	165	bar
Temperature of hydraulic fluid	65	°C

Tapping point used for test: at rear of tractor

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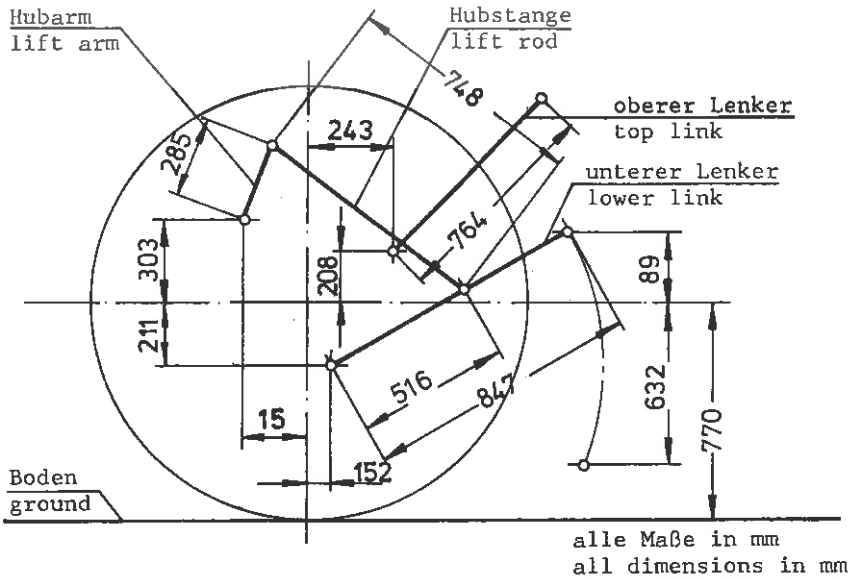
LINKAGE GEOMETRY when connected to the standard frame

Projected length in side view:

Lower links	847 mm
Lift arms	285 mm
Lift rods	748 mm
Top link	764 mm
Distance of lift rod connection point from pivot point of lower link	516 mm

The following dimensions are given relative to the rear wheel centre line, situated 770 mm above ground:

Lower link pivot point	152 mm behind,	211 mm below
Top link pivot point	243 mm behind,	208 mm above
Lift arm pivot point	15 mm forward,	303 mm above
Maximum and minimum height of lower link hitch points	632 mm below,	89 mm above
Height of lower link hitch points when locked in transport position	390 mm below	



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OPTIONAL TESTS

(9) ENGINE PERFORMANCE

Date of tests: 13th October 1981
Type of dynamometer: SCHENCK eddy-current dynamometer W 150

Power kW	Engine speed rev/min	Fuel consumption hourly l/h	Fuel consumption hourly kg/h	Fuel consumption specific g/kWh	Specific energy kWh/l
Maximum power					
At 2-hour test					
65.4	2280	17.31	14.40	220	3.78
At standard p.t.o. speed (1000 rev/min)					
65.3	2275	17.30	14.40	221	3.77
At rated engine speed					
64.6	2350	17.40	14.47	224	3.72
Part loads					
(i) 85% of the torque at maximum power at 2-hour test					
58.1	2386	15.94	13.26	228	3.65
(ii) unloaded					
-	2529	4.11	3.42	-	-
(iii) 50% of the load defined in (i)					
29.9	2453	9.88	8.22	275	3.03
(iv) maximum power					
65.4	2280	17.31	14.40	220	3.78
(v) 25% of the load defined in (i)					
15.2	2490	6.96	5.79	382	2.18
(vi) 75% of the load defined in (i)					
44.3	2424	12.88	10.71	242	3.44

Optimum fuel consumption: 210 g/kWh at 62.8 kW and 1903 rev/min
No load maximum engine speed: 2529 rev/min
Torque at maximum power (2 hours): 274 Nm
Maximum torque: 319 Nm at 1729 rev/min of the engine

Mean atmospheric conditions:	temperature	16 °C
	pressure	992 mbar
	relative humidity	43 %
Maximum temperatures:	coolant	87 °C
	engine oil	110 °C
	fuel	17 °C
	engine air intake	18 °C

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Motorleistung

Engine performance

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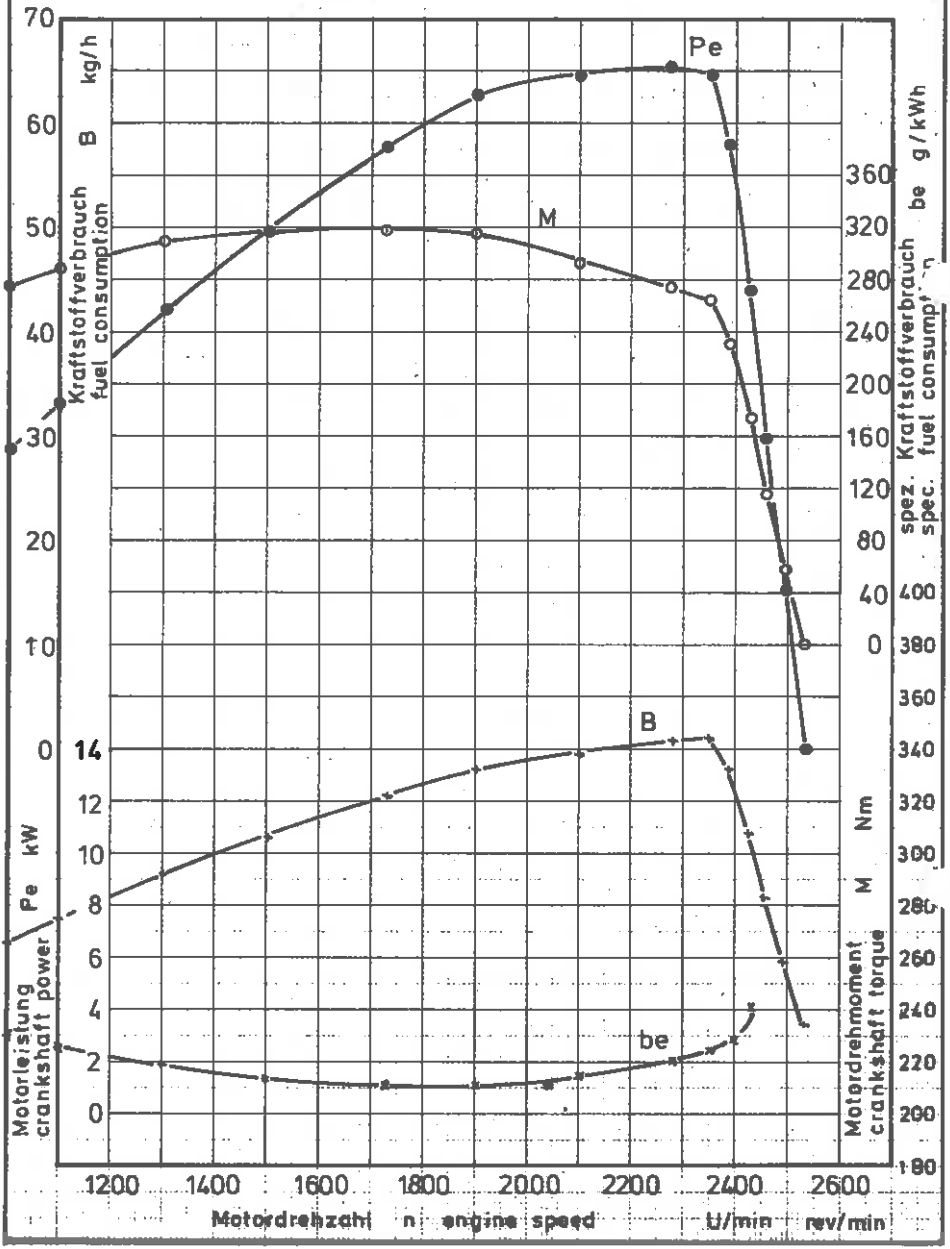
Test Nr. 80-258



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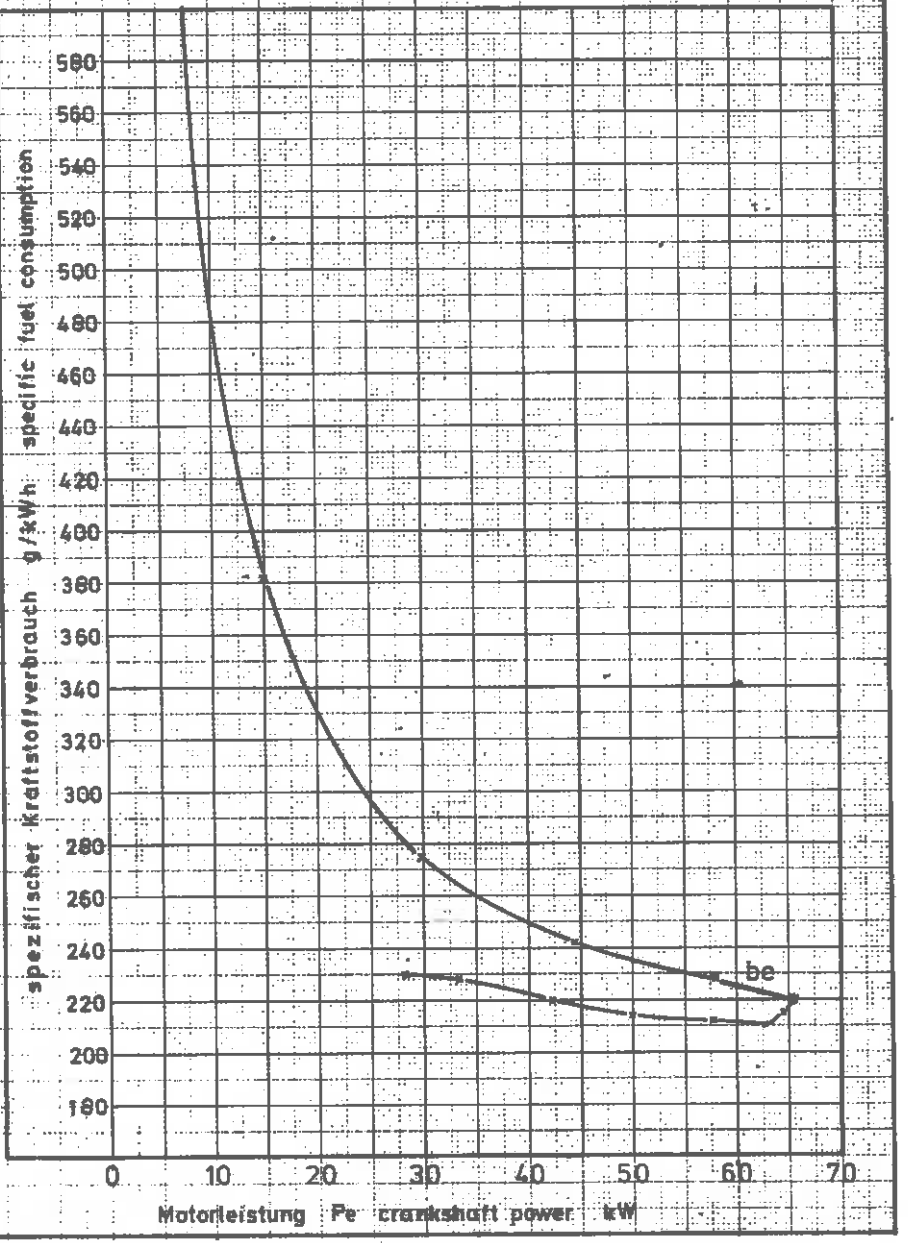
Motorleistung
Engine performance

Test Nr. 80-258



Motorleistung

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FENDT FARMER 309 LS

Engine performance

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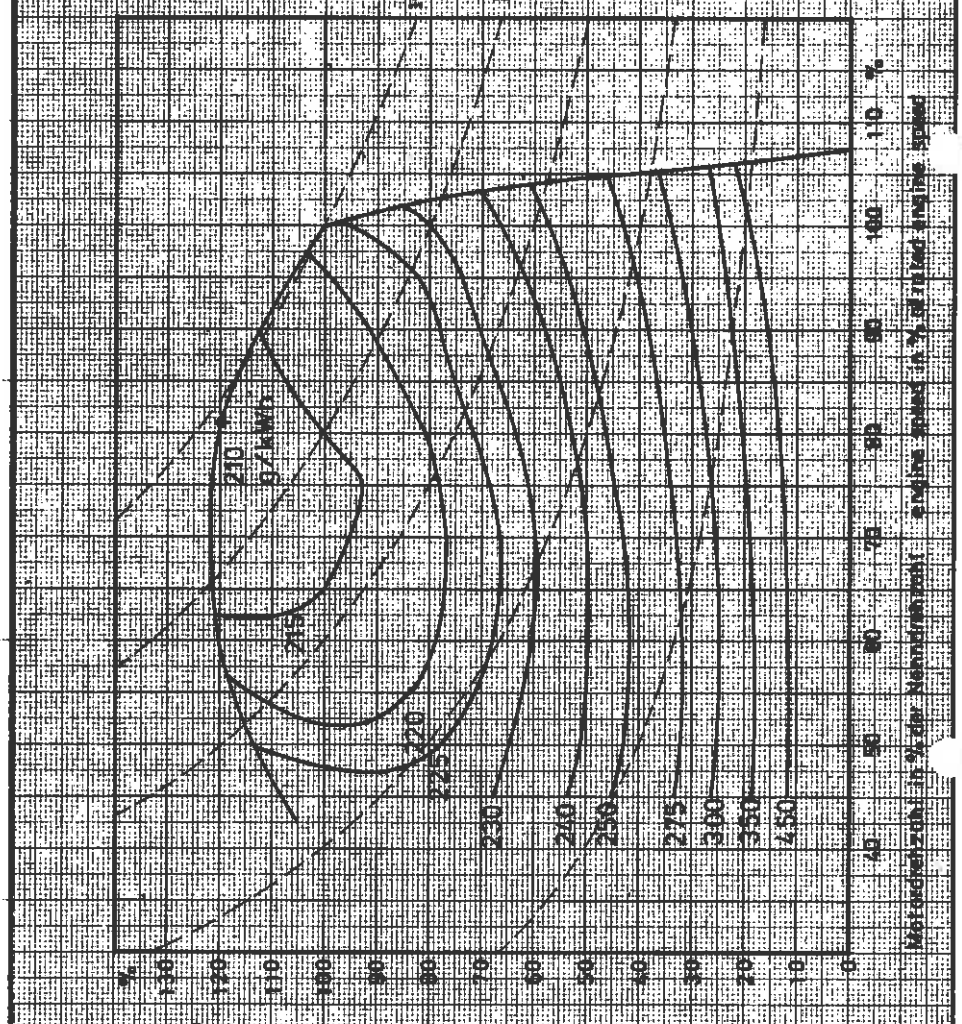
Motorleistung in % der Leistung bei Nenndrehzahl

engine power in % of power at rated engine speed



Belastung in % des Drehmomentes bei Nenndrehzahl

load in % of torque at rated engine speed

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ADDITIONAL TESTS

Power lift performance at minimum lift rods length

The manufacturer wanted an additional power lift performance test at minimum lift rods length and maximum mechanical advantage

Lift rods length 638 mm
Top link pivot point 248 mm above rear axle centre

Date of test: 7th December 1981

Power Lift

	Height of lower hitch point above ground in down pos. mm	Vertical movement mm	Max. force exerted through full range daN	Corresp. pressure of hydraul. fluid bar	Moment about rear axle daNm	Max. tilt angle of mast over range of lift degrees
At hitch points	311	680	3150	158	-	-
On the frame	311	700	2610	158	4199	7

Temperature of hydraulic fluid at start of test 65°C

Lifting heights relative to horizontal lower links

mm	-280	-270	-200	-100	0	100	200	300	400	430
Lifting forces at hitch points										
daN	3150		3190	3260	3280	3300	3260	3210	3190	
Lifting forces at test frame										
daN		2990	2990	3010	2990	2950	2840	2740	2610	2610

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